

Managing Financial Integration and Capital Mobility—Policy Lessons from the Past Two Decades

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Abstract

Emerging market experience over the past two decades has revealed the tenuous links between external financial integration and faster growth, and the proclivity of such integration to fuel costly crises. Emerging markets learned, converging to the middle ground of the macroeconomic trilemma. Following their crises of 1997–2001, emerging markets added financial stability as a goal, self-insured by building up international reserves, and adopted a public finance approach to financial integration. The global crisis of 2008–09 illustrated that the advanced economies “overshot” the optimal degree of financial deregulation, while the resilience of the emerging markets validated their public finance approach to financial integration.

1. Introduction

Emerging market countries suffered a string of severe macroeconomic crises between 1997 and 2001, starting with East Asia and then continuing with Russia (1998), Brazil (1998–99), and Argentina and Turkey (2000–01). These crises coincided with a period of growing external financial integration. In spite of the reforms subsequently undertaken, few economists would have predicted that developing countries, emerging market and nonemerging market alike, would perform as well as they did during the Great Recession of 2008–09 and the accompanying global financial crisis.¹ Not only did developing countries display considerable resilience during the crisis of 2008–09, their economic take-off, including the most populous countries China and India, has resulted in a situation where more than half of global gross domestic product (GDP) growth originated in these countries by 2010 at purchasing power parity (PPP) exchange rates. In this sense, the crisis of 2008–09 is a tectonic shift that could unravel Bretton Woods II (BW II) and herald a move from a US-centric towards a multi-polar world.²

BW II viewed financial integration and global imbalances as a win–win configuration—the allegedly superior financial intermediation of the USA absorbed the excess savings of the rapidly growing countries, facilitating their growth as the USA became the demander of last resort. Accordingly, the dollar standard of BW I continued its operation in a modified world of growing financial and trade integration,

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with the USA the provider of global liquidity and global insurance services to emerging markets (henceforth, EMs). The massive accumulation of international reserves (IR) was seen as the counterpart of the BW II system, whereby the USA benefited from the “exorbitant privilege” of funding its fiscal and current account deficits at a lower cost, while China enjoyed export led growth.

With the Great Recession and global financial crisis of 2008–09 raising profound questions about the efficacy of international capital markets and the inadequate regulation even of sophisticated financial systems like that of the USA, this paper’s quest is timely. It examines the impact of financial policies and capital mobility on the growth and stability of EMs and the global economy and ends with a summary of policy conclusions.

2. Literature Survey

A detailed literature survey is contained in Aizenman and Pinto (2011).³ The main points are the following:

Financial Integration and Growth

The widespread expectation at the beginning of the 1990s that growing financial integration would speed up growth in developing countries and help with income convergence by channeling global savings into investment in capital-scarce developing countries has not so far materialized (Aizenman et al., 2007; Prasad et al., 2007). Fast-growing developing countries have tended to self-finance their investment and run current account surpluses. This finding is evocative of the “Feldstein–Horioka puzzle” (Feldstein and Horioka, 1980).⁴

One reason that capital does not flow from rich to poor countries, as the neoclassical model predicts, is that expected marginal returns may not be higher in poorer countries even though they have lower capital-to-labor ratios, in line with the Lucas Paradox (Lucas, 1990). Even when marginal returns are higher in poorer countries, the welfare benefits of financial integration may be limited. Gourinchas and Jeanne (2006) found that the welfare gains in switching from financial autarky to full capital mobility equal a paltry 1% increase in domestic consumption for the typical non-Organisation for Economic Co-operation and Development (OECD) country.

The type of financial inflow matters. For example, foreign direct investment (FDI) could help narrow productivity gaps through technological spillovers. Aizenman and Sushko (2011a) examine the differential impact of portfolio debt, portfolio equity, and FDI inflows on 37 manufacturing industries and 99 countries over 1991–2007, extending the Rajan–Zingales (1998) methodology.

Financial Integration and Takeoffs

A burgeoning literature on financial integration and growth takeoffs has been motivated by the growing global weight of EM economies and the growing gap between nonemerging developing and EM countries (Hausmann et al., 2005; Aizenman and Spiegel, 2010, and the references therein). Aizenman and Sushko (2011b) find that higher FDI inflows are associated with a higher takeoff *probability* relative to zero FDI inflows, and this effect is highest for the Latin America subsample. In contrast, a higher stock of short-term external debt has been associated with a substantial

negative effect on the probability of a takeoff, and the cumulative effect of the short-term debt overhang is largest for Latin American countries. Yet, virtually all the takeoffs were associated with a rise in portfolio debt inflows, indicating debt maturity matters. The association between financial links through portfolio equity flows and takeoffs is negative.

The *duration* of takeoffs is increased by higher net portfolio debt inflows while the opposite is true of equity inflows. In contrast, higher net FDI inflows at the time of the takeoff are associated with a lower probability that the takeoff will be sustained. This finding parallels that of Prasad et al. (2007), who find that the positive association between FDI and economic growth observed between 1970 and 2000 no longer held between 2000 and 2004, and of Aizenman and Sushko (2011a), who find that the relationship between FDI inflows and real sector growth turns from positive to negative following prolonged periods of steady FDI inflows into a country.⁵

Financial Integration and Crises

The spate of EM crises after 1997 is eloquent testimony to the difficulty of avoiding macroeconomic and financial crises with an open capital account and a high degree of financial integration. In addition, countries which suffered a serious macroeconomic crisis between 1997 and 2001 were apt to exhibit a fixed exchange rate (all; explicit in some cases as part of disinflation programs, e.g. Argentina, Brazil, Russia, Turkey and implicit in the case of Thailand and other East Asian countries); unsustainable government debt dynamics (Argentina, Russia) or big jumps in government debt as a result of private sector bailouts (East Asia, Turkey); and balance sheet problems (East Asia in particular, also Argentina and Turkey, with liabilities, often short-term, denominated in US dollars and assets in local currency).⁶

A cautionary tale for the EU accession EM countries emerges from the experience of Greece and Portugal. Blanchard and Giavazzi (2002) argued that the large current account deficits these countries were running at the turn of the millennium could be explained by higher returns to capital in these capital-scarce, poor countries relative to the Euro Area average, which would propel investment. In addition, higher expected growth would tend to increase consumption in line with the permanent income hypothesis and lower savings. In contrast to Greece and Portugal (but in keeping with self-financed growth) Blanchard and Giavazzi noted that Ireland grew much faster by raising public and hence national savings dramatically. This enabled current account surpluses *and* higher investment rates. Ireland's PPP GDP per capita raced from 70% of the EU average in 1987 to 120% by 2002. As of writing this paper, all three countries are mired in a serious sovereign debt crisis—Ireland's driven by the bailout of its private banks and Greece's and Portugal's by unsustainable public debt dynamics.⁷

3. Developing Country Response to Macroeconomic Vulnerability

In the 1980s, most EMs operated with low financial integration and rampant capital controls, strong preferences for exchange rate stability, relatively low levels of international reserves-to-GDP ratios, and active monetary policy. These patterns were modified substantially during the 1990s and 2000s as EMs learned from successive crises.

Navigating the Trilemma

The macroeconomic policy trilemma, or the ability to accomplish at most two out of the following three policy objectives—financial integration, exchange rate stability, and monetary autonomy—is a key implication of the Mundell–Fleming macroeconomic framework. Most countries rarely face the binary choices articulated by the trilemma. Instead, countries choose the degree of financial integration and exchange rate flexibility. Aizenman et al. (2010) allow for this by constructing three indices measuring the trilemma dimensions of each country. Applying these indices, Aizenman et al. (2010) validated that the weighted sum of the three trilemma policy variables adds up to a constant, where all the weights are positive.⁸ This result confirms the notion that a rise in one trilemma variable is traded off against a linear weighted drop in the sum of the other two.

Figure 1 plots the average patterns of the trilemma indices for EMs, developing nonemerging market countries, and the industrialized countries, where each index is normalized to between 0 and 1 (the definitions are contained in the notes to Figure 1). The figure indicates that EMs have converged to the middle ground of the economic trilemma: controlled financial openness, managed exchange rate flexibility, and active monetary policy. In contrast, the OECD countries have opted for more polarized choices in the trilemma configuration: rapidly approaching full financial integration, and either flexible exchange rates (and active monetary policy) or a currency area in Europe (where each country gives up its monetary independence).

Between the late 1970s and the late 1980s, the level of monetary independence in industrialized and developing countries was similar. However, a divergence began in the early 1990s. While developing countries have been hovering around intermediate levels of monetary independence and slightly deviating from the cross-country average, industrialized countries have steadily become much less independent in terms of monetary policy, reflecting the decisions made by the euro member countries.

Regarding the exchange rate, industrialized countries experienced a constant level of exchange rate stability until the end of the 1990s, while developing countries have been on a clear trend toward more exchange rate flexibility since the mid-1970s. After the introduction of the euro in 1999, industrialized countries drastically increased the level of exchange rate stability while developing countries continued to remain around the mid-level of exchange rate flexibility.

Not surprisingly, industrialized countries have achieved higher levels of financial openness. The acceleration of financial openness in the mid-1990s remained significantly higher than the cross-country average of both the full sample and developing nonemerging markets subsample. For EMs, there has been a marked trend towards financial openness after 1990, but only after some retrenchment during the 1980s. Indeed, the main take away from the perspective of the discussion which follows is that EM countries sharply increased their financial openness after 1990 while settling for moderate levels of exchange rate flexibility and monetary policy independence.

Building up International Reserves⁹

Despite the proliferation of greater exchange rate flexibility for developing countries noted above, the ratio of international reserves (IR) to GDP has increased substantially, as shown in Figure 2. At the end of 1999, reserves were about 6% of global GDP, 3.5 times what they were at the end of 1960, and 50% higher than in 1990. Practically all the increase in reserve holdings has been in developing countries, mostly in

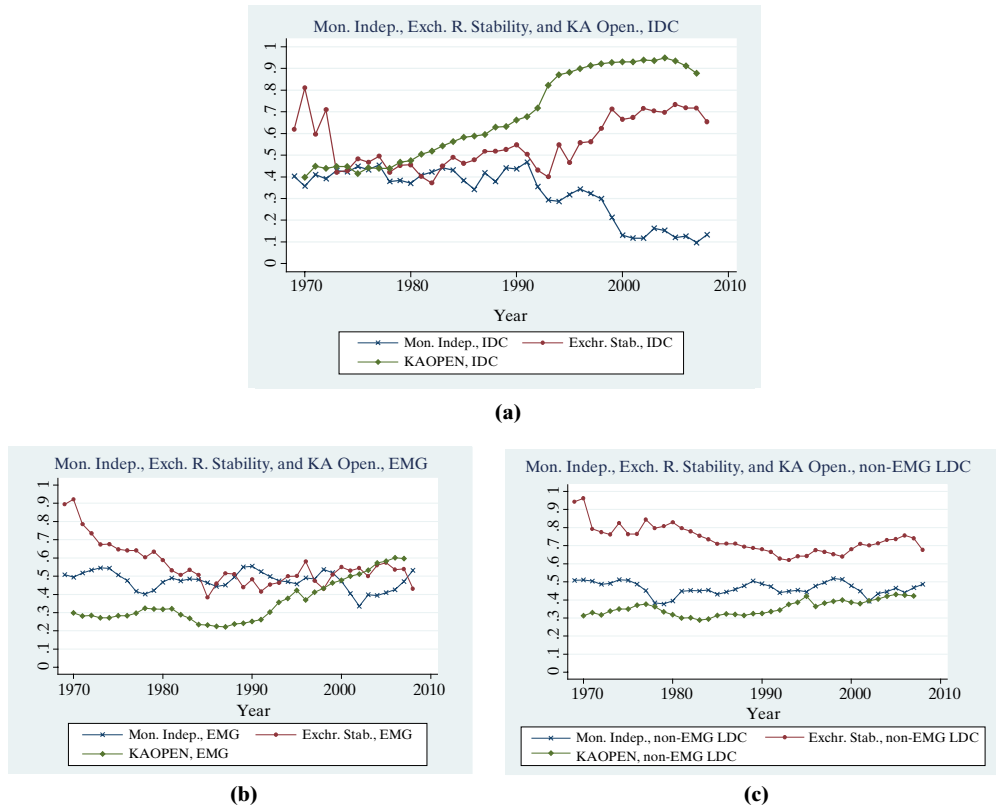


Figure 1. The Evolution of Trilemma Indices, 1970–2009 (see Aizenman et al. (2010) for further details). (a) Industrialized Countries; (b) Emerging Market Economies (c) Non-emerging Market Developing Countries

Definitions: The index for the extent of monetary independence (MI); $MI = 1 - 0.5[\text{corr}(i, i_j) - (-1)]$, where i refers to home countries and j to the base country (the base country is defined as the country that a home country’s monetary policy is most closely linked with, as defined in Shambaugh (2004). (The base countries group identified by Shambaugh include Australia, Belgium, France, Germany, India, Malaysia, South Africa, the UK, and the USA. Shambaugh fitted the base country j to country i , reflecting county i ’s policy choices.) By construction, higher values of the index mean higher monetary policy independence. For the countries and years for which Shambaugh’s data are available, the base countries from his work are used, and for the others, the base countries are assigned based on IMF’s *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)* and *CIA Factbook*.

Exchange rate stability (ERS), $ERS = \text{Annual standard deviations of monthly exchange rate series between the home country and the base country are calculated and included in the following formula to normalize the index between zero and one: } ERS = 0.01 / [0.01 + \text{stdev}(\Delta(\log(\text{exch_rate})))]$.

Financial openness (KAOPEN): KAOPEN = A *de jure* index of capital account openness constructed by Chinn and Ito (2008), normalized between zero and one. Higher values of this index indicate that a country is more open to cross-border capital transactions.

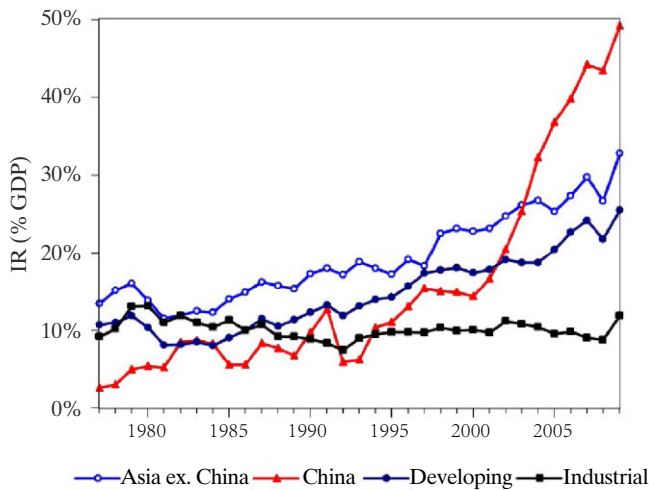


Figure 2. Hoarding International Reserves /GDP patterns, 1977–2009

Note: The figure depicts total reserves minus gold to GDP ratio.

Source: International Financial Statistics (IMF).

East Asia (Flood and Marion, 2002), with the question being raised of whether reserve holdings had become excessive (Edison, 2003). Reserve accumulation continued in the 2000s, with EMs increasing the ratio of international reserves to GDP from single-digit percentage levels in the 1980s to 15–30% of GDP for most, with some countries exceeding 50% (China; Hong Kong SAR, China; and Singapore in 2007)—something unprecedented.

There is a long literature dating to the 1960s on why countries accumulate international reserves (IR), which is reviewed in Aizenman and Pinto (2011).¹⁰ The early literature focused on IR as a buffer stock in supporting an adjustable-peg or managed-floating exchange-rate regime against trade volatility. By the 1990s, financial integration had become paramount and the Guidotti–Greenspan rule (IR to at least equal short-term external debt, namely, total external debt with an original or remaining maturity less than a year plus interest due) took over in 1999. The emphasis shifted to providing the central bank with the necessary liquidity in case of a sudden stop in capital flows, thereby preventing an output decline.

A new variable crept into the debate after the 1997–98 crises: the rapidly changing structure of EMs' financial integration, which implied that future crises would not resemble earlier ones. For example, Korea lifted restrictions on foreign equity ownership. As a result, foreigners' shareholding in total market capitalization rose from 12% in 1997 to 40% by 2003. Arguably, the sizable accumulation of reserves by Korea during that period may have reflected the wish to cover short-term external debt plus some portion of the foreigners' shareholdings.¹¹ These findings led to the notion of self-insurance.¹²

Self-insurance is a natural progression in the excessive reserves debate. The magnitude and speed of the reversal of capital flows throughout the 1997–98 East Asian financial crisis shocked most observers. East Asian countries had been perceived as less vulnerable to the perils associated with hot money than Latin American countries. After all, these countries were more open to international trade, had sounder fiscal policies, and much stronger growth performance. In retrospect, the 1997–98

crisis exposed the hidden balance sheet vulnerabilities of East Asian countries, forcing the market to update the probability of sudden stops affecting all countries.

Obstfeld et al. (2010) link reserve hoarding to three factors associated with the shift discussed above in the trilemma configuration since 1990. The first factor is the “fear of floating,” manifested in the desire to tightly manage the exchange rate (or to keep fixing it) for a range of reasons—to boost trade, mitigate destabilizing balance sheet shocks in the presence of dollarized liabilities, and provide a transparent nominal anchor for inflationary expectations (Calvo and Reinhart, 2002). The second factor is the adoption of active policies to increase the depth of domestic financial intermediation through a larger domestic banking and financial system relative to GDP. The third factor is complementing the deepening of domestic financial intermediation with an increase in external financial integration. The combination of these three elements increases the exposure of the economy to financial storms, in the worst case leading to financial meltdowns, as was vividly illustrated by the 1994–95 Mexican crisis, the 1997–98 East Asian crisis, and the 2001–02 Argentine financial collapse.

Notwithstanding financial considerations, the debate over excessive reserves remains alive; see Jeanne and Ranciere (2006), Jeanne (2007), and Garcia and Soto (2004). This is mainly because much of the reserve buildup has been in East Asian countries where the chances of a capital account crisis appear low. However, these results above were obtained before the global financial crisis of 2008–09. This raises the question anew of whether reserve holdings were excessive or eventually worth it, since they helped underpin resilience during the worst global crisis since World War II. We turn to this question next.

4. A Public Finance Approach to Financial Integration

With financial factors becoming dominant during the 1990s, the macro challenges facing developing countries went beyond navigating the trilemma triangle. More financially open, financially deeper countries, with greater exchange rate stability tended to hold more reserves against both external and domestic shocks. Nevertheless, the idea that EMs held excessive reserves persisted. In parallel, and somewhat schizophrenically, the feasibility of EMs being able to self-insure against sudden stops was raised. Following the 1997–2001 crises, Caballero (2003) summarized the state-of-the-art on insuring EMs. He argued that available instruments might hedge the annual fiscal revenues of a commodity-exporting country against oil or copper price risk, but not against a sudden stop. Caballero therefore proposed new instruments centered on contingent bonds targeted explicitly at exogenous shocks not under the control of EMs. On the reserve build up, he noted: “. . . these economies are self-insuring through costly accumulation of large international reserves and stabilization funds. Most individuals would be ‘underinsured’ if they had to leave a million dollars aside for a potential automobile collision and the liabilities that would follow, rather than buying insurance against such event; countries are no different. Underinsurance is what greatly amplifies these countries’ recessions.”

Whether or not the reserve accumulation by EMs was excessive, it is critical to underline that they did much more than simply build up reserves after the 1997–2001 crises. Table 1 provides more detail by linking specific policy measures to the three generations of crisis models developed to capture the growing coverage and sophistication of the underlying crisis elements.¹³ The table adds two elements to the policy trilemma: the accumulation of IR, which has been discussed above; and government’s intertemporal budget constraint. IR accumulation has proceeded in tandem with

Table 1. *Evolving Crisis Response of Emerging Markets*

<i>Goal</i>	<i>Policies</i>	<i>Comments</i>
1. Restore sustainable debt dynamics (<i>First generation</i>)	<ul style="list-style-type: none"> • Raise primary fiscal surpluses for prolonged period • Improve expenditure composition and tax regime • Strengthen fiscal institutions 	Might have to cut even good public investments in order to raise primary surpluses (similar to external debt overhang of 1980s)
2. Lower contingent liabilities associated with private sector (<i>Third generation</i>)	<ul style="list-style-type: none"> • Shift to flexible exchange rates • Monitor private external borrowing and currency mismatches • Strengthen financial institutions 	Flexible exchange rates will reduce incentive for currency mismatches but direct controls may also be needed by central bank on volume of private external debt and loan-to-deposit ratios of commercial banks
3. Insure against shifting market sentiment and possible sudden stops (<i>Second generation</i>)	<ul style="list-style-type: none"> • Build up foreign exchange reserves • Restrict currency mismatches on government and private balance sheets 	“Ideal” level of reserves will depend upon short-term external debt, flexibility of exchange rates and extent of currency mismatches

Source: Chapter 8, Pinto (2012).

measures to bolster the public finances: according to the arguments laid out in Pinto (2012) reforms which lowered public indebtedness while curbing contingent liabilities from private sector balance sheets have been pivotal in establishing credibility and lowering vulnerability. The two together have buffered the move to the trilemma middle ground and facilitated financial stability. In other words, the EMs response evolved into a “public finance approach” to financial integration and managing macroeconomic risk.

The public finance approach has three elements: first, putting the fiscal house in order so as to create space for addressing tail risks;¹⁴ second, recognizing from experience that good management of the public finances is not enough—costly externalities and bailout costs associated with the private (especially, financial) sector need to be factored in; and third, strengthening financial sector regulation and supervision are essential.

The efficacy of self-insurance underpinned by the public finance approach to financial integration is demonstrated by the resilience of developing countries during the Great Recession notwithstanding the skepticism about self-insurance expressed in Caballero (2003).¹⁵ The reason is that EMs went considerably beyond simply building up IR. They benefited by adopting controlled exchange rate flexibility and the active management of external balance sheet exposure by using reserves to cover short-term debt and in some cases taking steps to minimize currency mismatches on private sector balance sheets. During the 2008–09 crisis, about half of the EMs managed the crisis without significant IR depletion (including Chile, China, Columbia, Egypt, Israel, Thailand, and South Africa). Their reserves reduced their sovereign risk premia, deterring financial attacks. The other half of the EMs depleted between one-tenth and one-third of their IR at the peak of the global crisis.¹⁶ Most of them

bounced back to respectable growth paths without the need for massive external help. Those EM and developing countries that relied on external help (such as Korea and Mexico, which used swap lines extended by the US Federal Reserve Board or International Monetary Fund (IMF) stabilization packages) were characterized by large balance sheet exposure, where lax financial regulations prior to the crisis increased their vulnerability.

While the decoupling of EMs from the recession impacting the OECD has been elusive, EM countries have become key contributors to post-crisis global growth, led by the largest and most populous, China and India, and the other BRICS (Brazil, Russia, India, China) countries.¹⁷ Overall, these countries adopted a heterodox approach to self-insurance, consisting of a move to the trilemma middle ground supported by reserve accumulation and underpinned by the public finance approach to financial integration, the essence of which is that the social gains from deeper financial integration should be balanced against the social costs of growing exposure to turbulence.

5. Policy Implications of the Public Finance Approach

The global crisis of 2008–09, which originated in the financial sector of the USA on the one hand and showcased the resilience of developing markets on the other, points to the urgency for policy makers to balance the interests of the financial and real sectors. Low and uneven standards of prudential regulation could lead to devastating crises in the financial sector with negative spillovers into the real sector. The chances are that OECD countries overshot the optimal level of financial deregulation in the decade before the crisis, with financial globalization going too far. We illustrate this possibility in a reduced form model of the GDP, decomposing the economy into financial and nonfinancial sectors. The financial sector provides competitive financial intermediation services, measured by FI , facilitating the production of a stochastic final output, Y , $Y = Y(FI)$; $Y' > 0$, and $Y'' < 0$. Financial services FI are measured in constant dollar (equivalently, in terms of the numeraire good). The choice of FI is done prior to the realization of the random shocks affecting the final output, Y .

In the absence of distortions, with risk neutral agents, the optimal financial intermediation is at the level that maximizes the expected profits, $E[Y - FI]$. Consequently, the optimal level of financial intermediation, denoted by $FI0$, is at the level where the expected marginal benefit of financial intermediation, $E[Y']$, equals the expected marginal cost, 1. The corresponding total GDP is $Y(FI0)$. It can be decomposed to give the nonfinancial GDP; $GDP_{nf} = Y(FI0) - FI0$, while the GDP contribution of the financial sector is $FI0$. Figure 3, top panel characterizes the equilibrium at point A, where the expected cost of financial intermediation, $EMC[FI]$, equals the expected marginal benefit, $EMB[FI]$.¹⁸

Financial distortions, like moral hazard associated with the “too big to fail” doctrine, shift the private valuation of the expected marginal benefit of FI up, and the expected marginal cost down; to $EMB[FI^*]$, $EMC[FI^*]$ respectively. The net effect is that, relative to the nondistorted equilibrium, moral hazard induces excessive financial intermediation (shifting the equilibrium financial intermediation from point A to point B in Figure 3, lower panel, increasing the financial intermediation from $FI0$ to $FI0^*$). The welfare cost of the distortion induced by moral hazard is the dotted triangle at the bottom panel of Figure 3.

In a risk-neutral economy, policy z should be set to minimize the welfare costs of financial distortions. In such an economy, financial depth, FI/GDP , is not a goal by

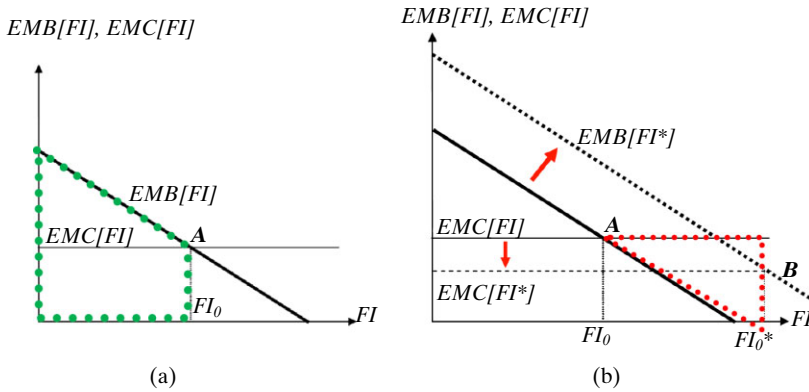


Figure 3. Optimal Financial Intermediation and Moral Hazard

Notes: The dotted trapezoid in panel (a) measures the expected GDP. The dotted triangle in panel (b) measures the welfare cost of the financial distortions leading to excessive financial intermediation

itself. Financial intermediation may be too lucrative if the expected social marginal benefit of financial depth falls short of the expected social cost.

We list three policy implications of the above framework:

- (1) Too much financial intermediation may be bad for the economy. Financial innovation would be undesirable if the marginal social benefit of financial innovation (the net increase in $E[Y - FI]$) falls short of the marginal social cost of the financial innovation, thereby reducing welfare. In the USA itself, the share of financial intermediation was about 5% of GDP in 1980. It reached about 8% prior to the crisis, with the bulk of the increase happening during the 2000s. Financial intermediation was well below 5% during most of the 20th century, with the exception of the decade prior to the Great Depression and Great Recessions (see Philippon, 2008). While correlation is not causation, the search for the gains in the performance of nonfinancial sectors as a result of the massive increase in financial depth in the USA and the global economy remains elusive.
- (2) There is a potential rivalry between the interests of the financial sector and the nonfinancial economy. Regulation level z , $z =$ (leverage, reserve ratio, intermediation tax, etc.), should be set at a level such that the social marginal cost of FI equals the marginal social benefit measured in relation to the nonfinancial sector.
- (3) There is a built-in bias against financial regulation. Crises prevented by tighter financial regulation are unobservable and therefore not credited to the policy maker. Yet, the cost of financial regulation is transparent and debited to the policy maker. This asymmetry means that a higher regulatory effort, while preventing crises, tends to erode support over time for future regulation (Aizenman, 2011a).

6. What Should Developing Countries do post Great Recession?

The massive resumption of capital flows to EMs in 2010 has increased the need for prudential regulation of hot money. These inflows reflect both “yield chasing” induced by the low interest rates and quantitative easing in the USA and Europe, and the presumption that EMs are the new locomotive for global growth. What should EMs do?

With vulnerability endogenous to private agents' actions and behavior, optimality calls for a mixture of partial insurance and preventive methods reducing the frequency and intensity of the calamity (analogous to requiring installation of fire alarms and external lights in a house, setting speed limits for drivers, making air-bags in cars mandatory, etc., as controls or conditions for insurance provision). This logic applies equally well to the EMs' exposure to sudden stops and deleveraging shocks—developing countries must supplement hoarding international reserves with policies that would reduce their exposure to capital flight. Such policies could include proactive steps to place public finances on a sustainable trajectory by raising primary fiscal surpluses while simultaneously taking steps to limit contingent liabilities from private external debt and mismatches on private sector balance sheets—as indeed several important EMs did after 2001.

Today's challenges are exemplified by Korea. The Bank of Korea may hold IR as a buffer against instability associated with private banks' external borrowing, the carry trade and other activities, the social benefit of which may fall short of the social cost associated with the growing exposure of the taxpayer to the bailout of systemic financial players in bad times.¹⁹ Regulations reducing external borrowing may trim the demand for IR, increasing the overall welfare of the economy. The public finance approach is reflected in Hyun Song Shin's advice to South Korea's government: ". . . it should tax the wholesale liabilities of the country's banks. Whenever a South Korean bank wants to expand its loan book faster than its retail deposits, it relies on foreign borrowing to fill the gap. So a levy on these extra liabilities would serve to limit banks' borrowing abroad" (*The Economist*, 11 November 2010).

Taxing surges in external borrowing by domestic banks is a discretionary tool that could support prudential supervision (Aizenman, 2011b). This policy tool is akin to an international version of the Federal Deposit Insurance Corporation's (FDIC's) policies in the USA. A deposit in a bank covered by the FDIC allows the bank to expand its balance sheet, increasing the expected liabilities of the FDIC (i.e. the taxpayer) at a rate proportional to the riskiness of bank's portfolio. The insurance offered by the FDIC destroys any incentive for the saver to monitor the bank. This distortion could be dealt with by imposing an insurance risk premium on the bank, reflecting its riskiness.

The main difference between the FDIC's risk premium and external borrowing by banks in EMs is that the FDIC covers deposits in US dollars, and is indirectly backed by the US ability to cover these liabilities by fiat money and/or domestic taxes. In contrast, external borrowing by EM banks increases the balance sheet exposure of the country to foreign currency debt. By analogy, this exposure should be dealt with by the accumulation of IR *and* by the proper risk premium, inducing banks to internalize the impact of external borrowing on the taxpayers' exposure to future bailouts. Ironically, economists who oppose an external borrowing tax, viewing it as an impediment to free mobility of capital, rarely support the abolition of deposit insurance!

In the meanwhile, concerns about the growing exposure of these countries to the risk associated with sudden reversal of hot money flows post 2008–09 is inducing EMs to adopt various regulations taxing external borrowing and hot money. These policies are not a substitute for the need to maintain fiscal and monetary discipline in EMs. Yet, short of moving to financial autarky, prudential regulations dealing with external borrowing may help in mitigating the downside risk of hot money; see Pasricha (2011) for a summary of these steps in 2010–11.

The effectiveness of prudential regulation in dealing with capital flows is an important research agenda. The well-documented experience of Chile with unremunerated

reserve requirement suggests that this policy changed the composition of inflows towards longer maturities, without significantly affecting the overall volume (see Edwards, 1999). Forbes et al. (2011) study the experience of Brazil and report that the regulations induced capital outflows in line with the authorities' intentions.²⁰ Experience suggests that the private sector reacts over time to the regulations and to changing global and local circumstances. Therefore, proper prudential regulation and supervision should be a dynamically evolving framework. This is vividly reflected in the experience of Korea and other countries.²¹ The interaction between the regulator and the private sector suggests that some regulations tend to lose their bite over time. Hence, policy makers should a mixture of temporary measures dealing with unanticipated transitory shocks, and more enduring policies (reserve requirements, taxes, etc.) at rates that respond to changing risk exposure and the size of capital flows.

7. Conclusions

A salient macroeconomic trend during the 1990s–2000s was the massive financial globalization of EMs. While the links between faster growth and the external financial integration of these countries has been tenuous at best, an unintended consequence has been their growing exposure to financial turbulence associated with sudden stops in capital inflows, capital flight, and deleveraging crises. The significant output and social costs associated with financial crises, estimated on average at more than 10% of GDP, has highlighted the need for going beyond the original macroeconomic trilemma. In response to the crises of 1997–2001, several EM countries added financial stability as an explicit goal, built up reserves, and adopted a public finance approach to financial integration that incorporated the control of private sector balance sheet vulnerabilities and the attendant contingent fiscal liabilities.

The subsequent resilience EMs displayed during the global crisis of 2008–09 is an eye-opener, not just for developing countries, but for OECD countries as well. Financial regulation and integration should be defined in the context of a public finance approach, aimed at maximizing the contribution of financial intermediation to the expected performance of the economy. The goal should not be to maximize financial stability, but to choose policies equalizing the expected social marginal cost of financial services and the expected social marginal benefit accruing to the nonfinancial sector.

The 2008–09 crisis demonstrated the risk of low and uneven standards of prudential regulation. In particular, bubbles in the real estate market, frequently associated with easy leverage and inflows of hot money, are too costly to ignore. Information technology (IT) bubbles subsidize investment in new technology, and may provide a social benefit if there is underinvestment in IT in the absence of bubbles. Besides, a few sophisticated agents are involved. Housing bubbles, however, lead to economy-wide damage, costly debt deflation, and a large stock of foreclosed houses. The USA is a prime example of a country where the real estate sector is pivotal in the business cycle, inducing Leamer (2007) to conclude that in the USA “Housing IS the Business Cycle.” This result may be US specific, reflecting the favorable tax treatment of housing, and the mortgage subsidies associated with the operations of Fannie Mae and Freddie Mac. Yet, in most countries, housing is the prime financial asset of the middle class, and turbulence in the real estate market directly affects the stability of the banking system.

Even if a bubble cannot be identified *ex-ante*, chances are that one can pin down the probability of a housing bubble. For example, during the 2000s, the probability of a

housing bubble was close to zero in Germany, yet positive and increasing in the USA (see Shiller 2000).²² Chances are that regulations lowering the loan to value ceiling (LTVC) reduce the probability of a bubble (in Hong Kong SAR, China; Singapore; and China, dynamic LTVC regulations are used in a counter-cyclical ways). Post 2008–09 crisis suggestions (Co-VAR, VAR, stress tests)²³ are useful, but simplicity and greater transparency of positions has its virtues: transparent LTVC regulations; and derivatives restricted to traded exchanges, where positions of systemic players are monitored, would help.

While a decisive approach to financial sector regulation is clearly needed—even to the point of curbing the growth and size of the financial sector—the chances are that financial system agents will resist change to protect their rents from one-way bets with publicly-funded bailouts on the downside. The built-in bias against financial regulation noted earlier needs to be recognized and counteracted. Financial integration during the 1990s–2000s globalized arbitrage, while the national tax bases have been saddled with the resultant costly bailouts at times of trouble.

In contrast to some OECD countries, which had access to elastic swap lines that facilitated their adjustment, most EMs and developing countries were left to their own devices, deleveraging their exposure by drawing down reserves, or more painful adjustments. The resilience of EMs and developing countries during the 2008–09 crisis validated the logic of self-insurance as part of the overall design of macroeconomic policies. A desirable configuration of macro policies that allowed countries to reduce their exposure to the 2008–09 crisis included: (i) sound management of the public finances to place public debt on a sustainable trajectory; (ii) building up international reserves; (iii) prudential steps to reduce contingent liabilities from private sector balance sheets; and (iv) moving to the trilemma middle ground with its emphasis on controlled exchange rate flexibility.

None of these policies would probably have sufficed on its own to insulate EMs from global turbulence; but agile combinations of these policies provided policy makers with the needed tools to limit debilitating growth and confidence crises in EMs in the wake of the global crisis. Indeed, the limited capacity to move along the lines proposed by Caballero (2003) and the validation of the gains from self-insurance is one of the lessons from the crisis. By virtue of their limited internal safety nets and their relative poverty, EMs do not have the luxury to wait for the collective resolution of the global imbalances and the proliferation of under-regulated financial flows that the Group of Twenty Finance Ministers and Central Bank Governors (G20) is aiming to address. Hence, self-insurance combined with the public finance approach to financial integration may be an optimal response of emerging markets in a second-best global structure.

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Notes

1. See for example, Development Committee (2010).
2. The Bretton Woods System or BW I was set up 1944 to deal with post-World War II challenges. This was a period when Western Europe and the USA engaged in growing trade integration while maintaining capital controls. The collapse of BW I in the early 1970s coincided with a rapid financial integration of the OECD countries. This was followed by the financial opening of emerging markets in the 1990s, leading to a rapid increase in their demand for international reserves and, according to Dooley et al. (2003), to the emergence of BW II.
3. This is the working paper version of this paper. This section has been compressed to economize on space.
4. See Obstfeld and Rogoff (1996) for further discussion of the various F–H interpretations.
5. One interpretation of this result is that countries in which the economic takeoff is driven by FDI inflows converge to a new steady state faster, resulting in a shorter duration of high growth rates. Alternatively, "green" FDI may compete for financing with domestic firms, crowding incumbent firms out of local bank lending, especially if the domestic financial industry is not sufficiently developed.
6. De la Torre et al. (2002) discuss preconditions for emerging markets to successfully integrate into financial globalization. For case studies, see Serven and Perry (2005) on Argentina, Pinto and Ulatov (2012) on Russia. An overview is contained in Gill and Pinto (2005). Aizenman and Sun (2009) document the key role of balance sheet exposure in explaining the use of international reserves by half of the emerging markets during the global crisis of 2008–09. See also Eichengreen et al. (2003) for a discussion of the implications of balance sheet exposures on the vulnerability of developing countries.
7. IMF (2008, chap. 6) discusses the contrast between the persistent current account surpluses in emerging Asia and the current account deficits in emerging Europe. Greece and Portugal illustrate that even seemingly benign current account deficits pose the risk of eventual vulnerability. The Irish crisis of 2011 is similar to East Asia's over 1997–98, where the public finances were sustainable but contingent liabilities built up on the balance sheets of the private sector. East Asia's crisis in turn was similar to Diaz-Alejandro's (1985) classic description of the crises in the Southern Cone and Chile in particular over 1979–82.
8. The analysis was applied to a panel of the trilemma indices of 50 countries (32 of which are developing countries) during the 1970–2006 period for which there is a balanced data set (the requirement of a balanced panel reduced the number of countries in the sample substantially). The study applies a linear regression, testing the hypothesis that the linear sum of the three indices (without a constant term) adds up to a positive constant, where all the regression coefficients are positive. The regression analysis confirms this hypothesis, with R^2 well above 0.9, for three subgroups: industrial countries, non-emerging developing countries, and emerging market countries. The overall results are robust to the possibility of allowing structural, endogenously determined breaks in the data (the years of 1973, 1982, 1997/98, and 2001 were identified as candidates for structural breaks, and tested for the equality of the group mean of the indices over the candidate break points for each of the subsample groups).
9. This section draws on Aizenman (2011b).

10. We regret that we are unable to cite all the excellent work by name because of space constraints and refer the reader to Aizenman and Pinto (2011) for a fuller list of references.
11. This policy stopped around 2005, delinking reserve accumulation from increases in external borrowing.
12. A rival view based on mercantilism especially in the context of China was advanced by Dooley et al. (2003).
13. The first generation crisis model honed in on the inconsistency of fiscal deficits financed by credit creation and a fixed exchange rate; the second generation on confidence crises, international liquidity and multiple equilibria; while the third brought in balance sheet exposures. Key contributions were made by Krugman (1979, 1999), Flood and Garber (1984), Obstfeld (1994), Chang and Velasco (2000), and Burnside et al. (2001). For summaries, see Frankel and Wei (2005) and Pinto (2012).
14. A vivid example of this policy has been Chile, where a fraction of the revenues from copper exports were saved in years when the price of copper exceeded a moving average of past years. In years when the price of copper has been below the moving average of past years, the accumulated funds have been used to buffer the fiscal expenditure of Chile: saving in good times, dissaving in bad times, and supporting the counter-cyclical fiscal policy stance of Chile. Commodity-driven swings of boom and bust have defined Latin America's economic history for the past 100 years. "That is a cycle that needs to be ended," Velasco said. "We have been out to show that a Latin American country can manage properly, and not mismanage, a commodity cycle. You save in times of abundance, and you invest in lean times." *Bloomberg*, 23 April 2009.
15. Remarkably, there was not a single systemic financial sector crisis in any emerging market, even though systemic banks in some countries (e.g. Latvia, Ukraine) came under threat.
16. Emerging markets that lost at least 10% of reserves include Russia (36%), Poland (28%), Malaysia (27%), Korea (25%), India (21%), Peru (17%), Indonesia (16%), Turkey and Brazil (about 10%). See Aizenman and Sun (2009) for further discussion.
17. See for example, Canuto and Giugale (2010).
18. In terms of Figure 3, in the absence of distortions, $EMB[FI] = E[dY(FI)/dFI] = E[Y]$; $EMC[FI] = E[dFI/dFI] = 1$. Note that total expected GDP equals the trapezoid below the bold curve, $EMB[FI]$; between zero and FIO .
19. See Aizenman (2011b) for a study of Korea's under-regulated external exposure prior to the 2008–09 crisis, and a public finance view of optimal regulation external borrowing and hoarding of IR. See Ostry et al. (2011), Jeanne and Korinek (2011) for further analysis of conditions conducive to the inclusion of capital controls in the policy toolkit of EMs. Dominguez et al. (2011) noted the association between IR and carry trade: "While carry-traders borrow in low interest currencies and invest in high interest currencies, most reserve building countries invest in low interest foreign currencies and borrow at the (relatively higher) domestic interest rate." These observations are consistent with the view that the optimal accumulation of IR should be addressed as part of a comprehensive prudential regulation that would recognize possible externalities associated with carry trade exposures.
20. They looked at the impact of the March 2008 1.5% tax on fixed income investment, and the October 2009 2% tax on all foreign portfolio investments. Using fund level capital flows data (fixed income), they found that the regulations induced capital outflows from Brazil.
21. From 25 July 2011 onward, financial institutions operating in Korea were no longer allowed to buy FX-denominated bonds issued onshore by Korean companies ("Kimchi bonds") who swap proceeds into local currency. A Bank of Korea official explained the policy intent saying that "local firms should raise funds in won when they use the money here." Kimchi bond issuance had risen considerably in the months before the policy change, because all-in borrowing costs are lower than for comparable won-denominated debt (*Financial times*, "Seoul takes kimchi bonds off the menu," 19 July 2011).
22. Shiller's (2000) book (and its 2005 extended edition) explains why we should worry about the formation of bubbles in general, and in the housing market in particular. Curiously, Shiller's warning were ignored by policy makers, apparently being convinced by Greenspan's (2002)

position that monetary policy should not try to lean against asset-price bubbles, but rather should just clean up after they burst. This “cleaning up” turned out to be a validation of the large costs associated with debt deflation, and the *ex-post* inefficiency of the foreclosure system in the USA.

23. Co-VAR is the value at risk (VAR) of the financial system conditional on institutions being under distress.